

McGRAW-HILL DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS

Fifth Edition

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McGraw-Hill, Inc.

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**On the cover: Photomicrograph of crystals of vitamin B₁.
(Dennis Kunkel, University of Hawaii)**

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Fifth Edition**

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4 5 6 7 8 9 0 DOW/DOW 9 9 8

ISBN 0-07-042333-4

Library of Congress Cataloging-in-Publication Data

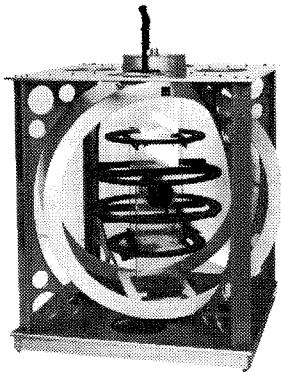
McGraw-Hill dictionary of scientific and technical terms /
Sybil P. Parker, editor in chief.—5th ed.
p. cm.
ISBN 0-07-042333-4
1. Science—Dictionaries. 2. Technology—Dictionaries.
I. Parker, Sybil P.
Q123.M34 1993
503—dc20 93-34772
CIP

INTERNATIONAL EDITION

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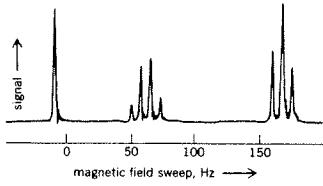
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PROTON MAGNETOMETER



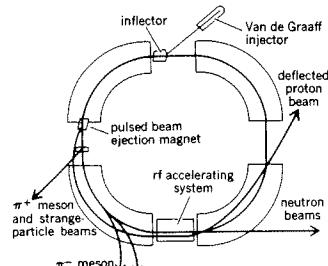
The water container and biasing coil assembly of the proton vector magnetometer. Instrument measures frequency of voltage induced in coil by the protons in water. (U.S. Coast and Geodetic Survey)

PROTON RESONANCE



Proton resonance spectra of ethyl alcohol at 40 megahertz. The three main resonance frequencies are due to protons in the OH, CH₂, and CH₃ groups respectively. (From J. D. Roberts, *Nuclear Magnetic Resonance*, McGraw-Hill, 1959)

PROTON SYNCHROTRON



Schematic diagram of the principal components of a proton synchrotron.

cious organisms in which the female reproductive structures mature before the male structures. { prō'tāj-ənē }

protointraclast [GEOL] A limestone component that resulted from a premature attempt at resedimentation while it was still in an unconsolidated and viscous or plastic state, and that never existed as a free clastic entity. { ,prōdō'in-trā,klast }

protolith [PETR] The original, unmetamorphosed rock from which a given metamorphic rock is formed. { 'prōdō,lith }

Protomastigida [INV ZOO] The equivalent name for Kinetoplastida. { ,prōdō'ma,stij-ədə }

protomer [BIOCHEM] One of the polypeptide chains composing an oligomeric protein. Also known as subunit. { 'prōdō'mer }

Protomonadina [INV ZOO] An order of flagellates, subclass Mastigophora, with one or two flagella, including many species showing protoplasmic collars ringing the base of the flagellum. { ,prōdō,mān-ə,dīnə }

Protomonida [INV ZOO] The equivalent name for Protomonadina. { ,prōdō'mān-ə-də }

protomylonite [PETR] A mylonitic rock that develops from contact-metamorphosed rock; granulation and flowage are caused by overthrusts following the contact surfaces between the intrusion and the country rock. { ,prōdō'mīlō,nīt }

Protomyzostomidae [INV ZOO] A family of parasitic polychaetes belonging to the Myzostomaria and known for three species from Japan and the Murman Sea. { ,prōdō,mīzō'stām-ə,dē }

proton [PHYS] An elementary particle that is the positively charged constituent of ordinary matter and, together with the neutron, is a building block of all atomic nuclei; its mass is approximately 938 megaelectronvolts and spin $\frac{1}{2}$. { 'prō,tān }

proton accelerator [NUCLEO] A particle accelerator which accelerates protons to high energies, as opposed to one which accelerates heavier ions or electrons. { 'prō,tān ak'sel-ə,rād-ər }

proton acid See Brønsted acid. { 'prō,tān 'as-əd }

protonate [CHEM] To add protons to a base by a proton source. { 'prōt-ən,āt }

proton capture [NUC PHYS] A nuclear reaction in which a proton combines with a nucleus. { 'prō,tān 'kāpcher }

proton drip-line [NUC PHYS] On a chart of the nuclides, which plots proton number versus neutron number, the boundary beyond which proton-rich nuclei are unstable against proton emission. { 'prō,tān 'drip,lin }

proton-electron-proton reaction [NUC PHYS] A nuclear reaction in which two protons and an electron react to form a deuteron and a neutrino; it is an important source of detectable neutrinos from the sun. Abbreviated PeP reaction. { 'prō,tān i'lek,trān 'prō,tān rē,āk,shān }

protoforma [BOT] A green, filamentous structure that originates from an asexual spore of mosses and some liverworts and that gives rise by budding to a mature plant. { ,prōtōn'ē-ma }

protonephridium [INV ZOO] 1. A primitive excretory tube in many invertebrates. 2. The duct of a flame cell. { ,prōdō'nāfridē-əm }

protonic acid See Brønsted acid. { 'prō,tān-ik 'as-əd }

proton-induced x-ray emission [ANALY CHEM] A method of elemental analysis in which the energy of the characteristic x-rays emitted when a sample is bombarded with a beam of energetic protons is used to identify the elements present in the sample. Abbreviated PIXE. { 'prō,tān in,düst 'eks,rā i,mish-ən }

protonium [ATOM PHYS] A bound state of a proton and an antiproton. { prō'tō-nē-əm }

proton magnetometer [ELECTROMAG] A highly sensitive magnetometer which measures the frequency of the proton resonance in ordinary water. { 'prō,tān ,mag'nā'tām-əd-ər }

proton microscope [ELECTR] A microscope that is similar to the electron microscope but uses protons instead of electrons as the charged particles. { 'prō,tān 'mī-krā,skōp }

proton moment [NUC PHYS] The magnetic dipole moment of the proton, a physical constant equal to $(1.41062 \pm 0.00001) \times 10^{-23}$ erg per gauss. { 'prō,tān ,mō'mēnt }

proton number See atomic number. { 'prō,tān ,nom-bar }

proton-proton chain [NUC PHYS] An energy-releasing nuclear reaction chain which is believed to be of major importance in energy production in hydrogen-rich stars. Also known as deuterium cycle. { 'prō,tān 'prō,tān ,chān }

proton-proton reaction [NUC PHYS] The initiating reaction

in the proton-proton chain, in which t a deuteron, a positron, and a neutrino. { 'prō,tān 'prō,tān rē,āk,shān }

proton-proton scattering [NUC PHYS] with another proton, usually the nucl. { 'prō,tān 'prō,tān 'skad'ərēt }

proton-recoil counter [NUCLEO] fast neutrons. { 'prō,tān 'rē,kōil ,kāt }

proton resonance [SPECT] A phen. absorb energy from an alternating mag. characteristic frequencies when they are a magnetic field; this phenomenon is u resonance quantitative analysis technj ēns }

proton-rich nucleus [NUC PHYS] At the ratio of proton number to neutro than that of nuclei found in nature. { 'prō,tān 'rīch ,nūklēus }

proton scattering microscope [SOLI] in which protons produced in a cold-c accelerated and focused on a crystal in a v reflected from the crystal strike a fluc visual and photographic display that of the target crystal. { 'prō,tān 'skad'ərēt }

proton stability constant [PHYS CHE] dissociation constant of a weak base stā'bil-ədē ,kān-stānt }

proton storage ring [NUCLEO] A mānts and vacuum chambers in which btons can be stored. { 'prō,tān 'stōrāj }

proton synchrotron [NUCLEO] A protons in circular orbits in a time-va which the orbit radius is kept con kā,trān }

proton vector magnetometer [ELEC] ton magnetometer with a system of au measurement of horizontal intensity or as total intensity. { 'prō,tān 'vek-tōr }

protophilic [CHEM] Strongly basic.

protoxylem [BOT] The initial pri from the procambium. { ,prōdō'əflō-ə }

Protophyta [BOT] A division of the p to one system of classification, set up the blue-green algae, and the viruses.

protoplasm [CYTOL] The colloidal

composes the living material of a cell.

protoplast [CYTOL] The living porti a unit; includes the cytoplasm, the n membrane. { 'prōdō,ə,plast }

protoplast fusion [GEN] A techniq plasts are joined or a protoplast is joir another cell in order to accomplish { 'prōdō,ə,plast ,fyū-zhān }

protopodite [INV ZOO] The basal s limb bearing an endopodite or exopod extremity. { prā'tāpō,dīt }

Protopteridales [PALEOBOT] An ex Polyptidae. { ,prōdō'ō,terā'dālēz }

protoquartzite [PETR] A well-sorted intermediate in composition between su quartzite, consisting of 75–95% quartz 15% detrital clay matrix and 5–25% un there is a greater abundance of rock grains. Also known as quartzose si dō'kwōrt,sīt }

protore [MIN ENG] 1. A primary through enrichment, can be modified t 2. A deposit which could become ec technological change occurred or { 'prōd,ōr }

Protosireninae [PALEON] An extinc mammals in the family Dugongidae for of Egypt. { ,prōdō'sē'renē,nē }

Protospondyli [VERT ZOO] An eq onotiformes. { ,prōdō'spōndō,lī }

protostar [ASTRON] A flattened mas hypothesized to form into a star. { 'prōstār }

protostele [BOT] A stele consisting surrounded by phloem. { 'prōdō,ə,stēl }

Protostomia [INV ZOO] A major divi